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I, JONNE YABSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PQ 8166 for a patent by YARRA RIDGE P/L filed on 15 June 2000.

I further certify that pursuant to the provisions of Section 38(1) of the Patents Act 1990 a complete specification was filed on 15 June 2001 and it is an associated application to Provisional Application No. PQ 8166 and has been allocated No. 51955/01..

WITNESS my hand this
Fifteenth day of August 2001

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PROVISIONAL PATENT APPLICATION

Title: Padlocks and Method of Manufacture

The invention comprises a padlock of the type that employs two balls 1, 2 to retain the shackle 3 within the casing 4 – Fig 1. The shackle comprises a U shaped member having two legs 5, 6 connected by an arcular portion 7 one of the said legs 6 being of extended length so as to retain the shackle in the housing when the padlock is unlocked. The shackle is locked when each leg has a ball, one associated with each leg, partly within a recess 8 in the side of the arm and partly within a recess 9 in the casing and prevented from being inwardly displaced by a cam 10 supported by the casing which locates with only working clearance between the balls. The shackle having the elongated leg has a portion towards the free end of reduced diameter 11 connected to the ball recess by a flat portion 12. The features are configured such that when unlocked the ball associated with the elongated leg can displace inwardly a limited distance sufficient to enable the ball to leave the recess to enter the flat portion while not moving sufficiently to enable the shackle to be removed. All the above is well known.

Commonly used padlocks have shackles where the recesses extend from one side of the leg to the other so in side view the entire recess profile is seen and the flat similarly extends from one side to the other – Figure 2. Generally shackle are turned on a lathe, bent and broached.

The invention employs a shackle having recesses manufactured by advancing a cutter or end mill axially into the leg to form a spherical or other recess 12 reflecting the shape of the cutter while the flat is manufactured by partly withdrawing the cutter from the recess on the elongated leg and advancing it horizontally along the length of the leg to cut out a cylindrical trough 13 having a bottom of the same depth as the portion of reduced diameter – Fig 3. This shackle has greater strength than conventional shackles and the bar comprising the shackle (before bending) can be manufactured in series of operations within the same machine. This would be done before bending.

The invention also provides a machine for bending the shackle comprising two clamps 14 supported relative to a cross guide 15 which allows the clamps to move towards each other while being angularly displaceable. The clamps are spring loaded 15 or otherwise urged towards each other and retained apart by a substantially pyramid shaped guide 16 which is connected to a cylindrical shoulder 17 of a diameter the same as the arcular portion of the shackle. The clamps have a cross slot 18 to accept a shackle leg and orthogonal to this and intercepting is a recess 19 housing a ball or balls 20. The clamp is configured such that when a shackle (unbent) is placed within the cross slots and an outer sleeve 21 is depressed the balls are driven partly into the recesses in the shackle to retain the ends of the shackle tightly within the clamps – Fig 4.

When the shoulder and guide are moved towards the shackle to cause it to bend each clamp is moved inwardly the same controlled distance by the associated spring while the shoulder provides a form about which the shackle may bend to form the arcular portion.

The guide 16 is profiled so that the clamps move inwardly as required to assist the bending of the shackle and so that at the completion of bending the shackle is held without any substantial axial loading.

Preferably at the completion of the cycle the springs are forced outwardly so as not to urge the clamps inwardly and the guide is withdrawn from the plane of operation so that the formed shackle is retained by the claps unstressed (ignoring internal stressing) and free to assume its natural position. At this point the position of the clamps is assessed electronically to determine if the legs of the shackle are the correct distance apart. If they are not the clamps are moved incrementally simultaneously the same distance in opposite directions to adjust the shackle bend. The adjustment procedure is iterated until the correct bend has been attained at which time the sleeves are raised to release the shackle.

John Russell Watts

June 16, 2000

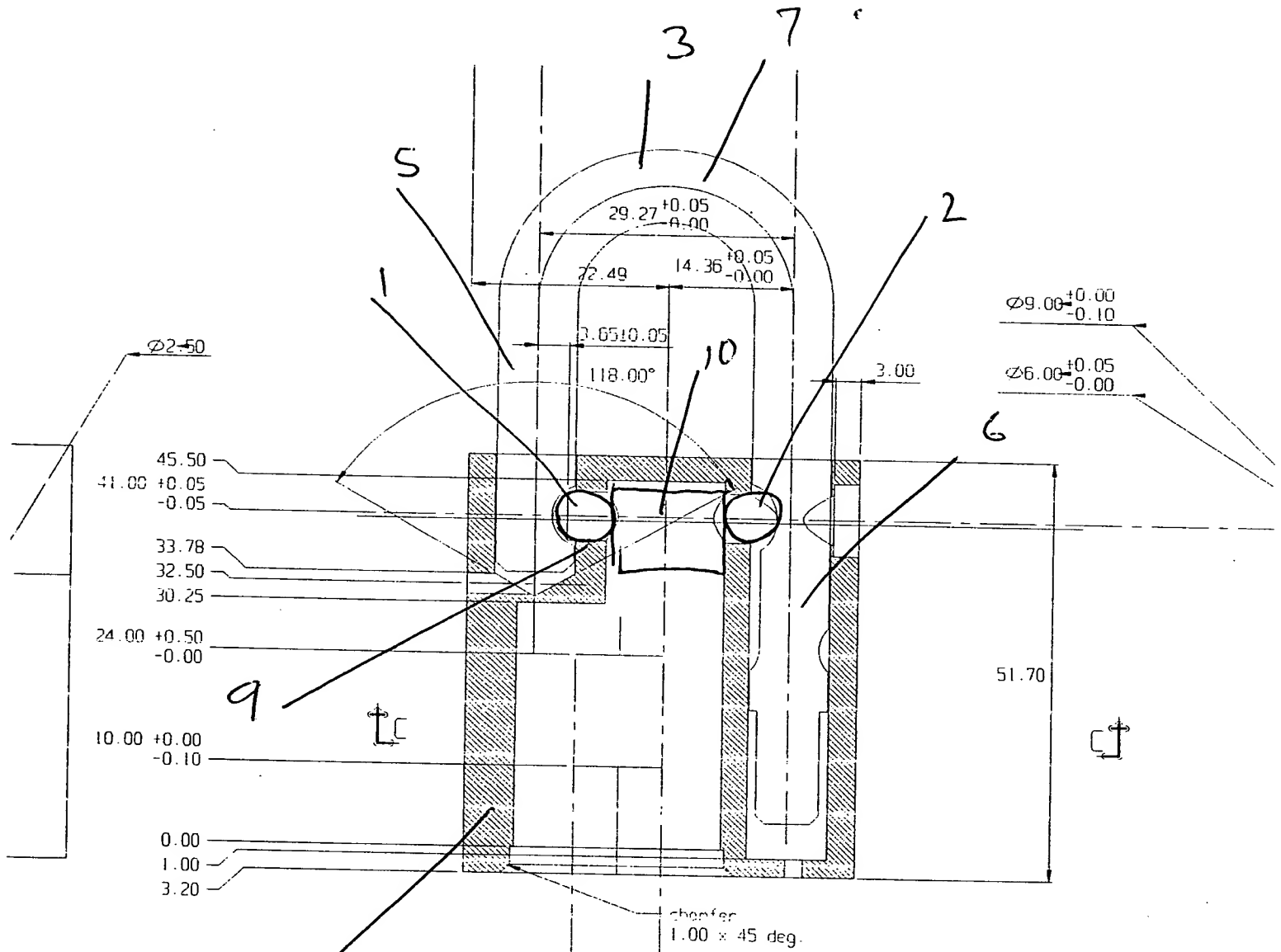


FIG 1

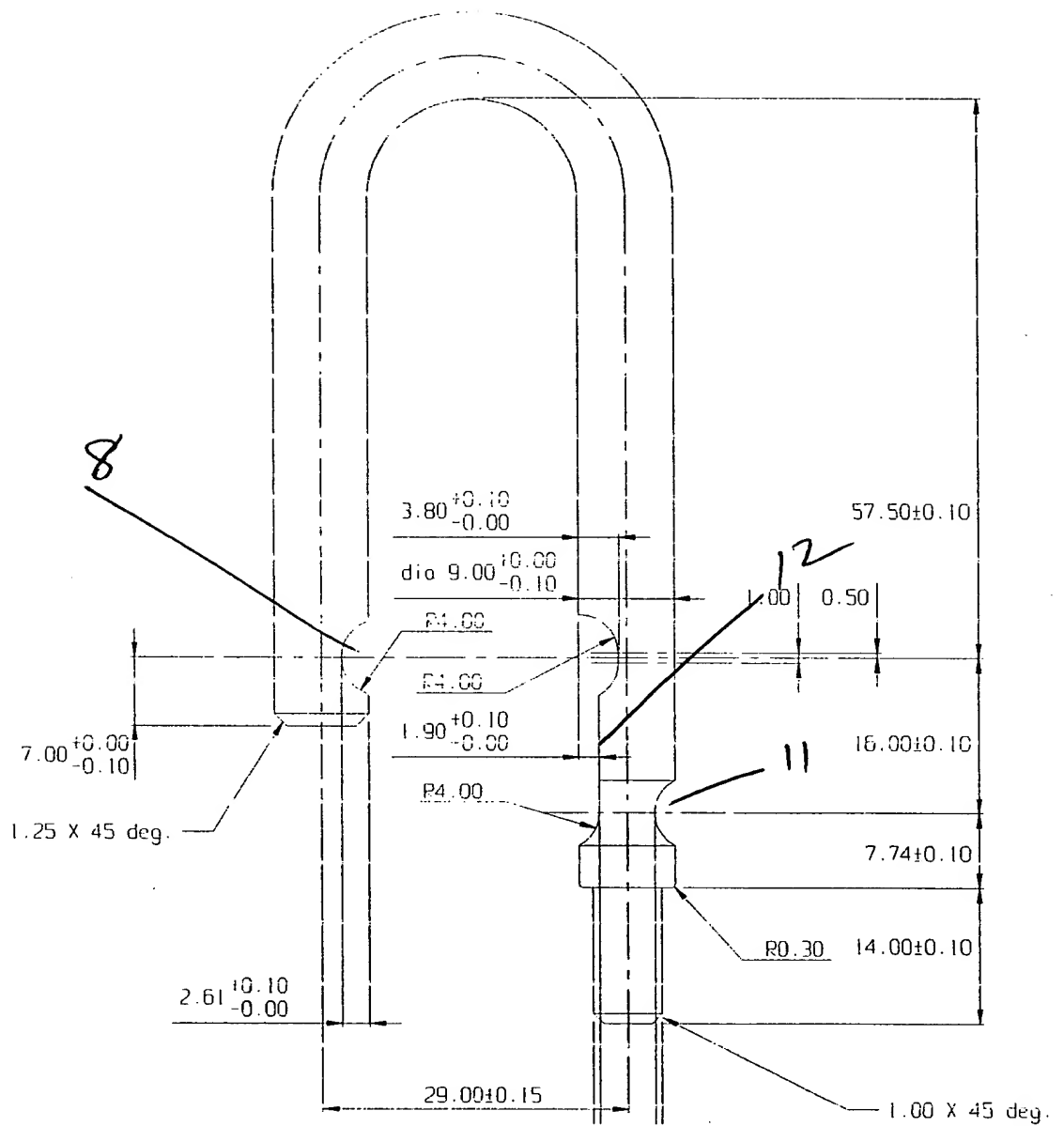


FIG 2

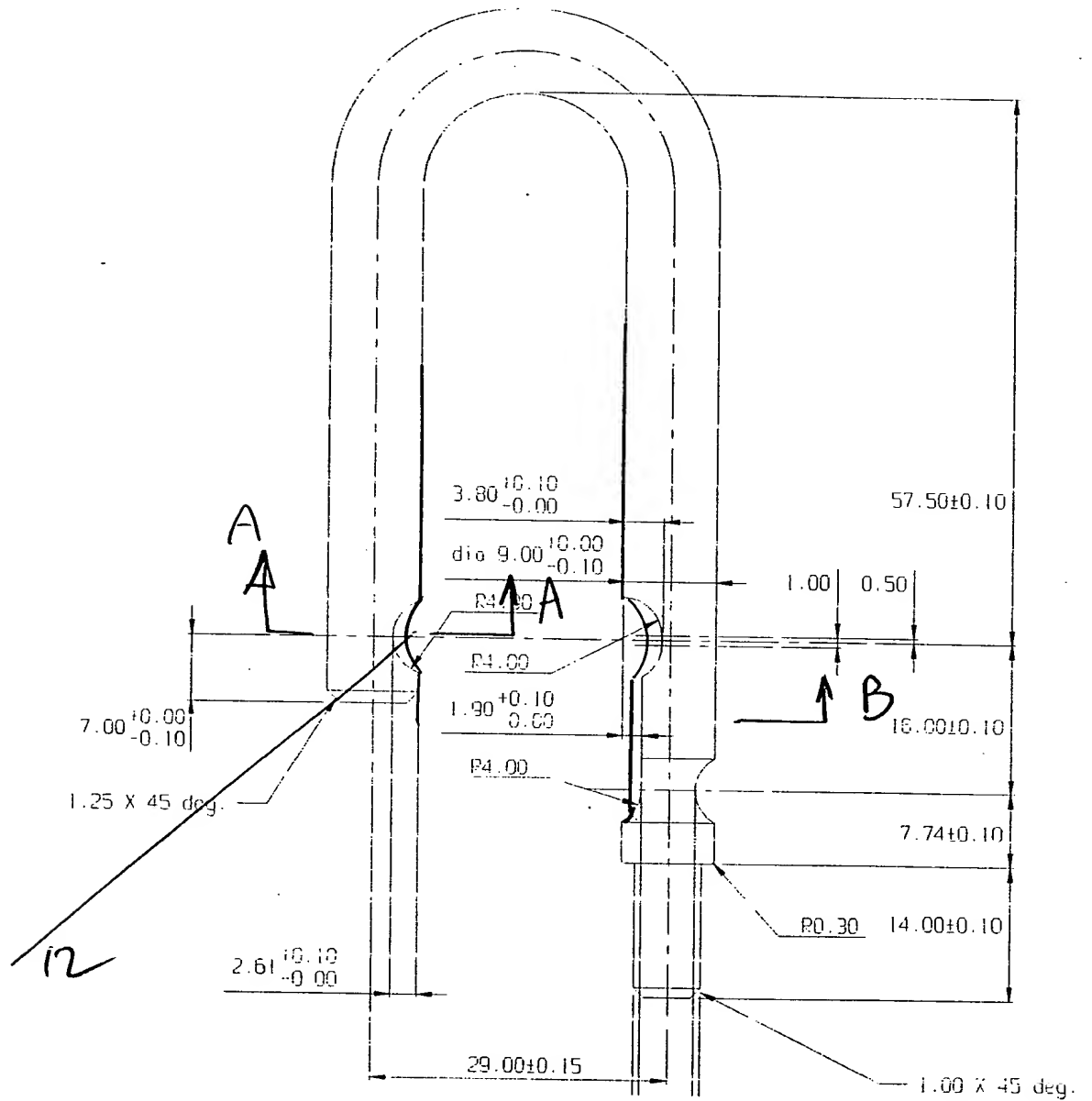
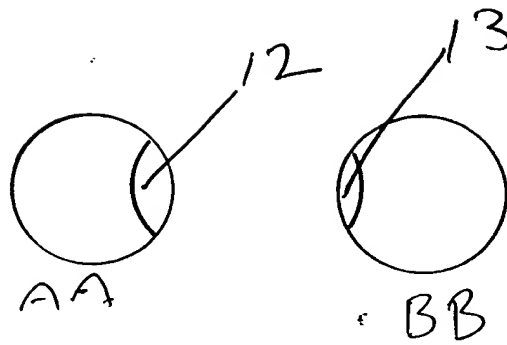


FIG 3

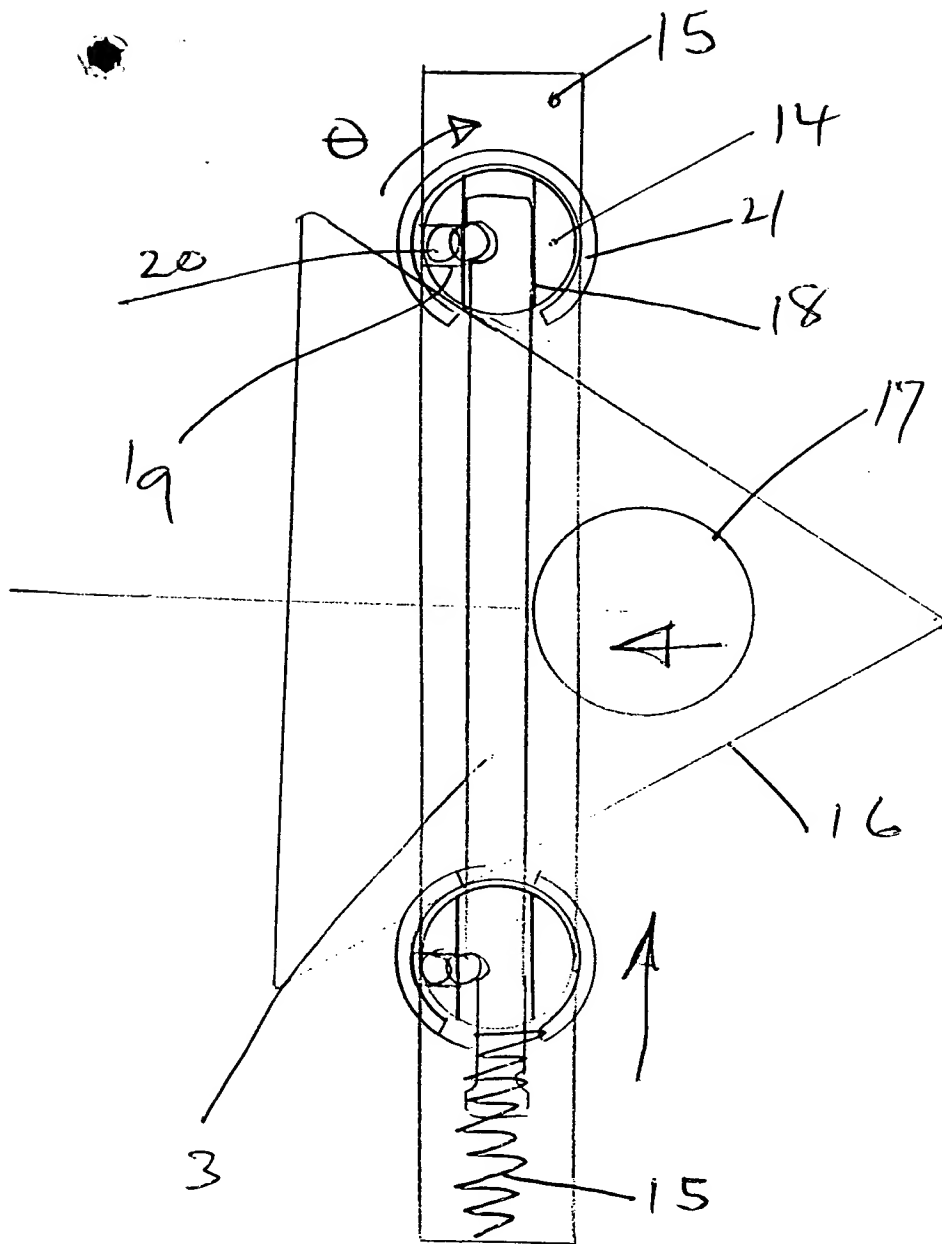


FIG 4